

2.4 EFFECTS FROM THE "COUPLING FROM BELOW" ON THE LOWER THERMOSPHERE DYNAMICS

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Results of wind measurements at the midlatitude ionospheric D region are presented. The wind regime of the lower thermosphere is rather sensitive to stratospheric temperature variations, especially to sudden stratospheric warmings. The longitudinal effect in D-region dynamics was revealed on the basis of simultaneous wind measurements at some points located practically at the same latitude but in different climatic regions. The distance differences are observed in the statistical distributions of wind parameters, during winter the average zonal wind speed over East Siberia was about twice that over Central Europe, and the semidiurnal zonal tide is weaker over East Siberia. The data on the seasonal reconstruction of circulation and the response of the D-region wind field to the stratospheric warmings depend on the intensity and locations of stratospheric disturbances in relation to the observatory. We interpret these experimental facts as a meteorological control of the D region and as a dependence of the lower thermosphere dynamics on the conditions of dissipation of internal waves propagating from the troposphere and stratosphere.

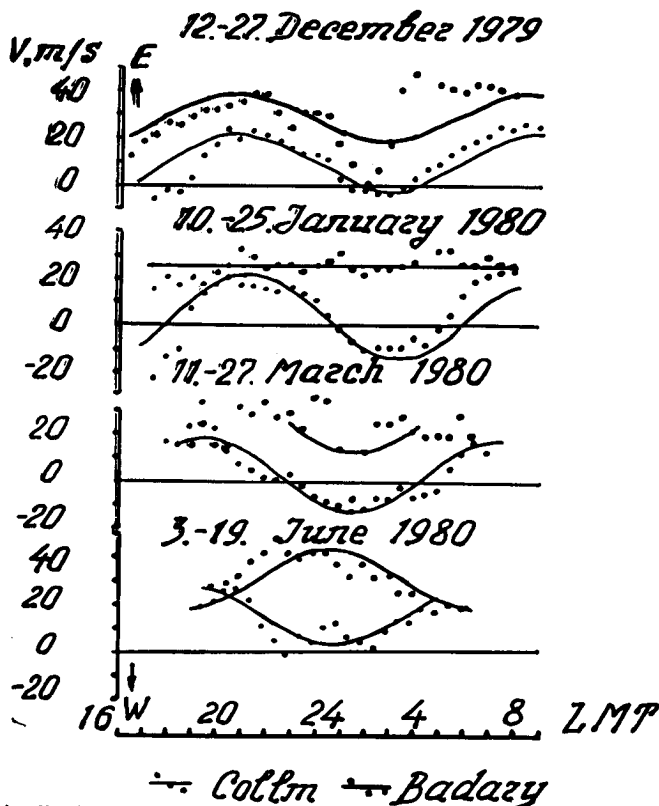


Figure 1. Longitudinal effects in the results of high atmosphere wind measurements (DI, 85-95 km) obtained over Central Europe and East Siberia: mean nighttime variations of the measured wind, zonal component.

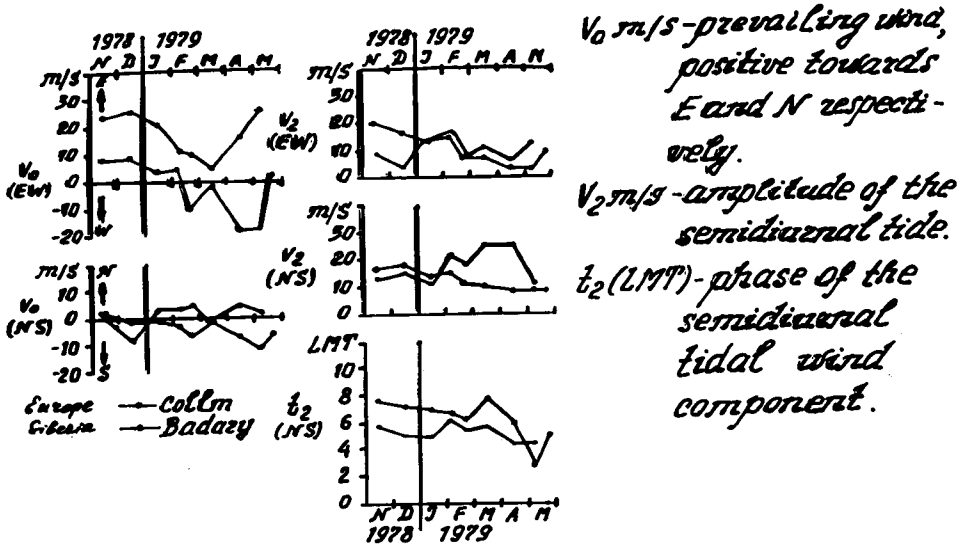


Figure 2. Longitudinal effects in the results of high atmosphere wind measurements (DI, 85 km) obtained over Central Europe and East Siberia: seasonal variations (November 1978 - May 1979) of the wind find parameters in the upper mesopause region.

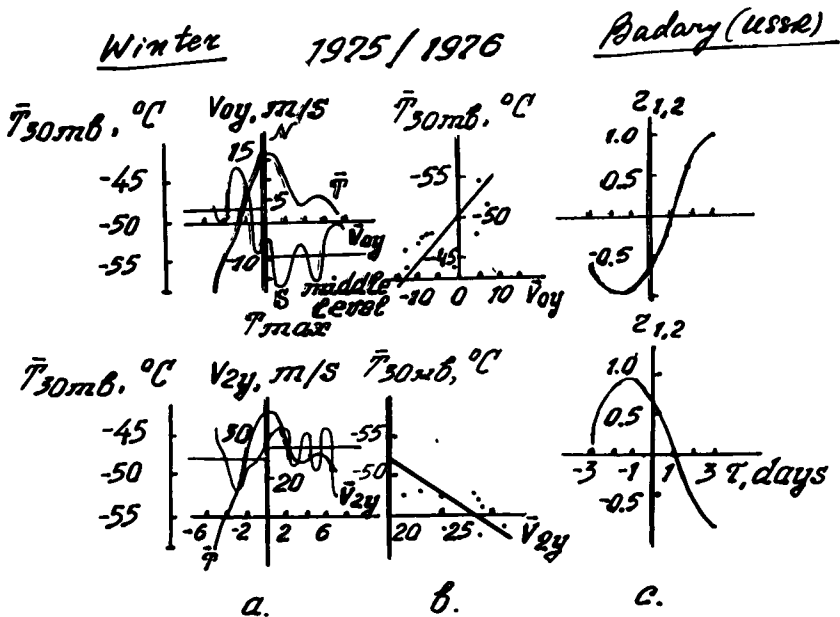


Figure 3. Comparison of $T^{\circ}\text{C}$ at 30 mb with meridional wind parameters (prevailing and tidal wind) in the ionospheric D region. (a) Superposed epoch method; (b) Correlograms; (c) Cross-correlation function.

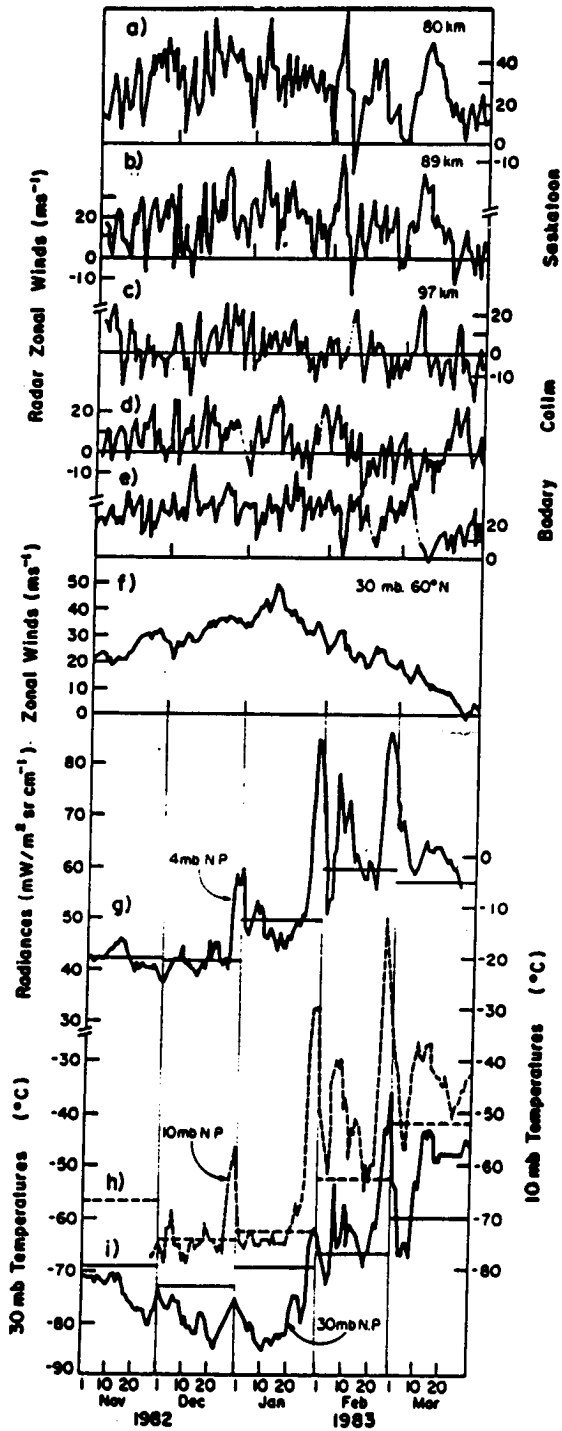


Figure 4. Stratospheric and mesospheric data during the winter 1982-83: (a),(b),(c) Saskatoon; (d) Collm; (e) Bodary; (f) 60°N winds; (g),(h), (i) North Pole data.